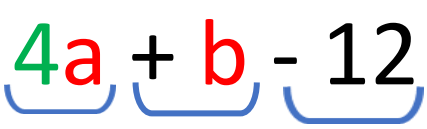
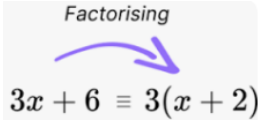
‘Algebraic manipulation’

The Knowledge for Progression:

- To know that terms are a constant, variable or combination of both and can be positive or negative. The 4 operations can be applied in the same way as numerical operations
- To know that an expression is made up of constants, variables and mathematical operations, but does not include an = sign
- To know that expanding means the removal of brackets by multiplication
- To know that factorising is a way of writing an expression as the product of its factors using brackets
- To know that a quadratic expression is in the form of $ax^2 + bx + c$

Speak Like a Mathematician

Key Word	Dual Coding	Definition
Variable		A letter or a symbol representing a numerical value
Coefficient		A numerical value that comes before a variable
Term		A constant, variable or combination of both
Expression	4a + b - 12	Made up of constants, variables, and mathematical operations
Linear Expression	2y + 3	A first order expression, it has no variable with an exponent higher than one
Quadratic Expression	$2y^2 + 3$	A second order expression, which is in the form $ax^2 + bx + c$
Equation	4a + b – 12 = 32	Two expressions connected by an equal symbol
Formula	$S = \frac{D}{T}$	Describes a mathematical relationship between variables
Expand		The removal of brackets by multiplying
Factorise		A way of writing an expression as the product of its factors using brackets

‘Standard form’

The Knowledge for Progression:

- To know that standard form is an alternative way to express large and small numbers
- To know that standard form has a set notation

Speak Like a Mathematician

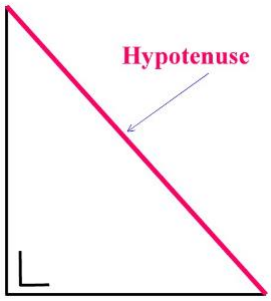
Key Word	Dual Coding	Definition
Standard form	Standard form is written in the form $a \times 10^n$. Where a is $1 \leq a < 10$ and n is any positive or negative number	An alternative number system to express large and small numbers

‘Pythagoras’

The Knowledge for Progression:

- To know that Pythagoras’ theorem can only be applied to right-angled triangles. It involves all three sides of the triangle
- To know that the hypotenuse of a triangle is opposite the right-angle. This will always be the longest side of the triangle
- To know $a^2 + b^2 = c^2$ where a and b represent the shorter sides of a triangle

Speak Like a Mathematician

Key Word	Dual Coding	Definition
Hypotenuse		The longest length of a right-angled triangle. Always opposite the right-angle

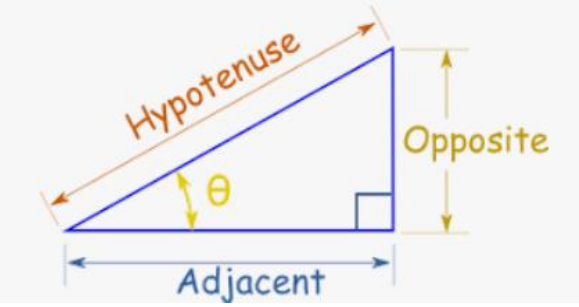
‘Trigonometry’

The Knowledge for Progression:

- To know that trigonometry can only be applied to right-angled triangles where two sides and one angle are involved
- To know that you can label the sides hypotenuse, adjacent and opposite
- To know that the hypotenuse of a triangle is opposite the right-angle. This will always be the longest side of the triangle
- To know that the opposite side is opposite the angle involved (not the right-angle)
- To know that the adjacent side is next to the angle but is not the hypotenuse
- To know that

, $Sin(angle) = \frac{Opposite}{Hyoptenuse}$ $Cos(angle) = \frac{Adjacent}{Hypotenuse}$ $Tan(angle) = \frac{Opposite}{Adjacent}$

Speak Like a Mathematician

Key Word	Dual Coding	Definition
Hypotenuse		The longest length of a right-angled triangle. Always opposite the right-angle
Opposite		The length opposite the angle involved (not the right angle)
Adjacent		The length next to the right angle, but not the hypotenuse

‘Solving equations and inequalities’

The Knowledge for Progression:

- To know that an equation contains an equals symbol, variable and constant
- To know that an inequality contains an inequality symbol, variable and constant
- To know that equation/inequality are formed from expressions
- To know that solve means to find the value of the variable
- To know that solving always requires performing the inverse operations

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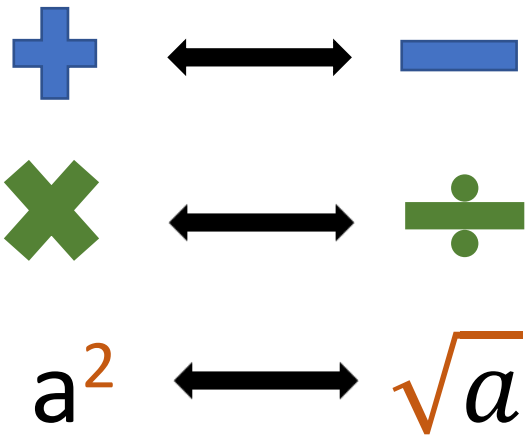
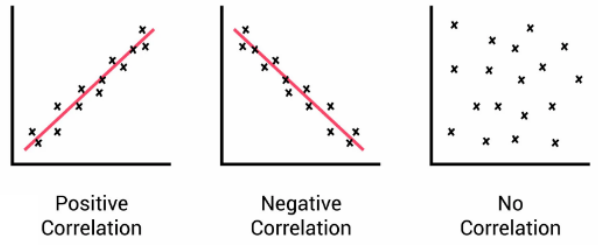
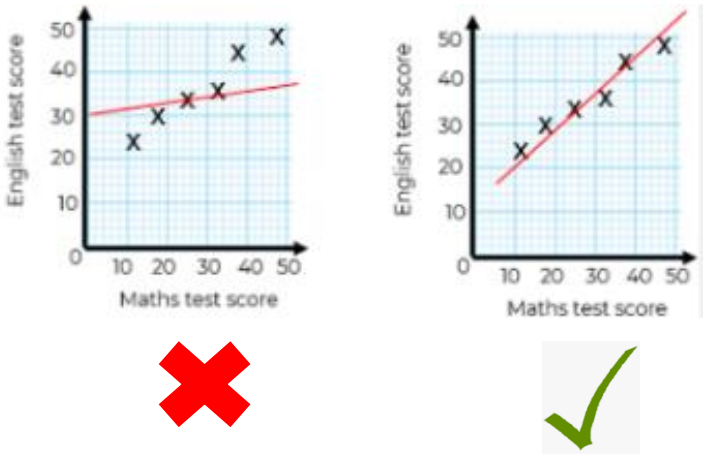
Key Word	Dual Coding	Definition
Equation	$4a + b - 12 = 32$	Two expressions connected by an equal symbol
Inequality	$4a + b - 12 > 32$	Two expressions connected by an inequality symbol
Solve	$\frac{x}{5} = 6$ $x = 30$	Find the value of the variable
Inverse		Opposite operations that reverse the effect of the other operation

‘Scatter graphs’

The Knowledge for Progression:

- To know that a scatter graph shows the correlation between two variables
- To know that a positive correlation means that as one variable increases, the other variable increases
- To know that a negative correlation means that as one variable increases, the other variable decreases
- To know that no correlation means there is no link between the variables
- To know that a line of best fit follows the trend of the data

Speak Like a Mathematician

<table>
<tr><th>Key Word</th><th>Dual Coding</th><th>Definition</th></tr>
<tr><td>Variable</td><td>
<table>
<tr><th colspan="2"><u>Variable</u></th></tr>
<tr><th><u>Independent</u></th><th><u>Dependent</u></th></tr>
<tr><td>Temperature</td><td>Ice cream sales</td></tr>
<tr><td>Age of car</td><td>Price of car</td></tr>
<tr><td>Height of student</td><td>Arm length</td></tr>
</table>
</td><td>The independent variable is the cause.
The dependent variable is the effect.</td></tr>
<tr><td>Correlation</td><td> 
</td><td>A measure of the strength of the association between two variables</td></tr>
<tr><td>Line of best fit</td><td> 
</td><td>A line drawn on to a scatter graph that follows the trend of the data</td></tr>
<tr><td>Trend</td><td></td><td>A pattern in a set of results displayed in a graph</td></tr>
</table>